NanoTech

Novel Gold Nanoparticles from BBInternational

A range of products has been exclusively commissioned for BBInternational from Professor Mathias Brust at Liverpool University, UK. The range includes:

1 Thiol-capped gold nanoparticles (2-5 nm) supplied in solution in an organic solvent for research use, with particular relevance for gas sensor technology or decorative coatings.

2 Naked gold nanoparticles in toluene (4-7nm), also for gas sensor technology or decorative coatings.

3 Mercaptyalkyl-PEG gold nanoparticles (2-5nm) for bio-conjugations and bionanotechnology applications.

See http://www.bb-international.com/products/ for more information and ordering.

Wanted – Editor for NanoGold News

Are you a researcher working on gold-related nanotechnology? Are you interested in the practical applications of the technology, as much as the underlying science? We are looking for an individual answering YES to these questions, who is interested in compiling NanoTech Gold News on our behalf. You should be able to write in an enjoyable and informal style, communicating key developments in gold-related nanotechnology to our target audience of leading researchers in academia and industry. In return for the written materials you will provide to us, World Gold Council will pay a quarterly honorarium. If you are interested in this opportunity, please contact Dr Richard Holliday at industry@gold.org

WORLD GOLD COUNCIL

GOLD news

ISSUE No. 3 WINTER 2007

IBM Develops 100,000 DPI Printing Using Gold

Courtesy of IBM Zurich Research Laboratory
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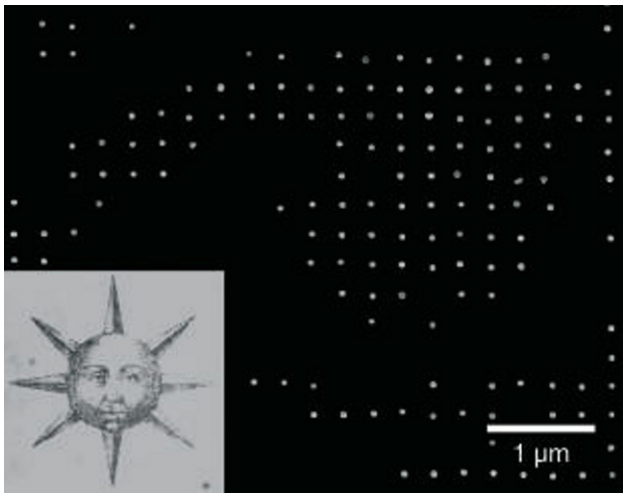
Scientists at IBM Research in Zurich, Switzerland have come up with a new method to print at ultra-high resolutions. In contrast to offset printing today, which operates at 1,500 dpi (dots per inch), this nano-scale printing method delivers 100,000 dpi, according to IBM.

Although the technique remains several years away from commercial availability, IBM expects it will allow companies to create nanostructures inside chips using high-volume manufacturing techniques. In the technique both gold colloid, 60 nm nominal diameter, purchased from BBInternational and synthesized nanoparticles were used. To demonstrate the new printing method, the researchers printed Robert Fludd's 17th-century image of the sun, the symbol for gold among alchemists, using 20,000 60-nanometer gold particles.

The full research paper can be seen at http://www.nature.com/nnano/journal/v2/n9/full/nnano.2007.262.html



Scanning tunneling micrographs showing the complete image of the sun motif (lower left) and a close-up showing the individual gold particles

Nanospectra Welcome Collaborations

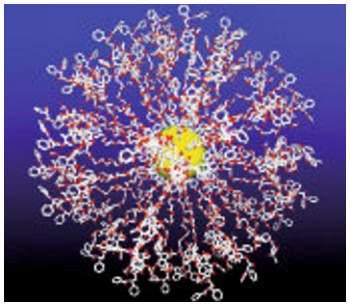
AuroShell™ particles (originally called nanoshells) are optically tunable particles composed of a dielectric core coated with a metallic gold layer. Nanospectra Biosciences has an exclusive licence to these materials, which were developed at Rice University. AuroShell™ particles have numerous potential applications across many industries including cancer therapy and imaging, drug delivery, microfluidics and diagnostic applications. To address this range of applications, Nanospectra welcomes the opportunities to collaborate with academic researchers and commercial institutions on these and other applications.

Companies interested in obtaining more information should contact Nanospectra via www.nanospectra.com

Gold Could Improve Taxol® Efficiency

Rice University chemists have discovered a way to load dozens of molecules of the anti-cancer drug paclitaxel, which is sold under the brand name Taxol®, onto gold nanoparticles. The result is a particle that literally bristles with the drug.

Paclitaxel prevents cancer cells from dividing by jamming their inner works. First isolated from the bark of the yew tree in 1967, it is a widely prescribed chemotherapy drug used to treat breast, ovarian and other cancers. However, one problem with using paclitaxel as a general inhibitor of cell division is that it works on all cells, including healthy cells that tend to divide rapidly. This is why patients undergoing chemotherapy sometimes suffer side effects like hair loss and suppressed immune function. Thus the aim is to deliver more of the drug directly to the cancer cells and reduce the side effects of chemotherapy, by using the gold nanoparticle as a drug delivery mechanism.



The new drug delivery system centres on a gold nanoparticle
Credit: Eugene Zubarev/Rice University

The research appears in the September 19 issue of the Journal of the American Chemical Society (J. Am. Chem. Soc. 2007, vol. 129, pgs.11653-11661).

GOLD 2009

GOLD 2009 – Nanotechnology

The 5th international conference focused on the science and applications of gold including Nanotechnology, as well as sessions on Chemistry, Materials Science and Catalysis will be held at the University of Heidelberg, Germany between 26th-29th July, 2009.

Nanotechnology topics covered will include:

- Applications including electronic, medical and decorative
- Colloid technology
- Cluster science
- Preparation & characterisation of gold nanoparticles
- Photophysical properties
- Self assembly systems

See the conference website for more details www.gold2009.org as they are announced or email industry@gold.org to be placed on the conference mailing list.

Easy Way to Make Perforated Nano-Gold Films

A new fabrication technique, known as soft interference lithography (SIL), makes it possible to inexpensively produce large sheets of gold films with virtually infinite arrays of perforations and microscale "patches" of nanoscale holes. A combination of interference lithography and soft lithography, SIL offers many significant advantages over existing techniques.

Research that led to the technology, funded by the National Science Foundation (NSF) and led by Teri Odom of Northwestern University, appeared as the cover story in the September 2007 issue of *Nature Nanotechnology*. Odom and her co-workers have succeeded in making gold films with arrays of perforations as small as 100 nanometers. The researchers' ability to make these optical metamaterials inexpensively and on large wafers or sheets is what sets this work apart from other techniques.